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AUTHOR Kolls, Mardel
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ABSTRACT

The use of young children's drawings as aids in assessing their levels of cognitive development and their readiness for reading is recommended in this paper. After showing how drawing development can be examined from a Piagetian point of view, the paper reports on an investigation involving 76 children aged five through eight years, which revealed a highly significant correlation between a child's drawing development and the ability to "conserve" on Piagetian tasks. It also showed a significant difference between the performance levels of children determined to be conservers, transitional conservers, and nonconservers. For each of these three cognitive groups, the paper presents and discusses a sample drawing. It then tells what characteristics of children's drawings to look for in determining their readiness for reading print, suggests ways to plan and conduct drawing activities, and points out how drawing can be useful as an instructional tool in reading and in the development of abilities necessary to such activities as observation, organization, and problem solving. (GT)

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Children's Drawings: Readiness Measure and Resource for Learning

Mardel Kolls

Curious about the prerequisites to reading print and what relationships they might have to cognitive development, I became interested in the child's earliest use of a written symbol system — DRAWING. It was through the work of Dolores Durkin that a relationship between writing and early reading was first established (1). I wondered to what extent cognitive development was a contributing factor in developing early concepts related to the use of symbols. Recognizing that every child begins to use and understand visual symbols he has created long before he learns to read print, to write, or do arithmetic, the study of this development and the relationship of cognitive growth in their use seemed like a good starting point for investigating readiness for reading print.

Concerned with the amount of testing going on in our schools today and the limited information normative data provide, I hoped that the results of my investigation would not only yield information about the learning process, but also provide a viable alternative for collecting important instructional data about an individual's cognitive capabilities. Educators faced with the task of developing human potential must develop an awareness of *all* ways children represent what they know and resist the temptation to limit observations of learning to a narrow set of skills defined as "the basics."

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Within the confines of the next few pages, I will share with you the findings of my investigation into children's drawings and some of their educational implications. I shall begin by stating the point of view from which this article is written.

Traditionally, the study of art has been approached from three points of view: (1) as representative of reality; (2) as interpretive or expressive of it; or (3) as entirely an abstraction in which the focus is on line, color, form and surface interrelationships (2). To the psychologist and investigators such as myself, art also consists of equivalences or at least of relationships between objects and ideas. Through experience, the child develops a mental image or concept of an object. In the beginning, the young child is primarily dependent in this activity on visual perception. Later, through his own actions on objects, he begins to build a concept or knowledge of the objects in his environment. According to Piaget, it is the *action* rather than the perception that becomes the primary source of knowledge (3).

To examine drawing development from a Piagetian point of view, we must begin with the 'sensorimotor' period. Art begins with representational thought and is a part of the child's whole structuring of space. It is during this period of development that topological relationships are established; however, drawing development does not begin until the child makes a mark on paper with the intention of representing an idea or object.

The very young child possesses five symbolic functions for representing experience and bringing meaning to his surrounding environment. Piaget refers to these as the 'semiotic functions' which take the form of (1) deferred imitations, (2) symbolic play, (3) graphic representation, (4) mental imagery, and (5) language. In most children language is the most highly developed symbolic function. Children with highly developed graphic functions are usually referred to as 'artists.'

Viewed within the context of representational thought, drawing and language are developing symbol systems rooted deeply in the child's ability to organize experience. When a child draws an object, he infers he is representing reality as he knows it to exist. At first, because his knowledge is very specific, the young child's symbols are idiosyncratic. As the

child continues to interact with the environment, his knowledge becomes restructured as a result, and his drawings increase in 'naturalism.' There appears to exist a parallel development between drawing and cognition. Learning to think is learning to organize one's experiences. Drawing then is therefore visual thinking.

Based on the findings of my investigation, I would like to suggest that children's drawings are a kind of "cognitive blueprint" of the child's logical reasoning abilities. My purpose in all this is to bring to the attention of educators a human resource for learning that is slowly being eliminated from our curriculum.

The Study

Seventy-six children, ages five through eight, participated in this investigation. Each child was individually tested on four Piagetian conservation tasks (number, matter, area, weight) and three drawing tasks (Goodenough-Harris *Draw-a-man*, Luquet-Piaget *House-Tree*, and the *Cup Sequence* copying task). For a complete description of the tests and scoring procedures see Kolls (4). Based on overall performance on the conservation tasks, participants were classified as conserver, nonconserver, or transitional conserver. Drawing development was then empirically analyzed within the three cognitive groupings. All spontaneous speech was recorded and analyzed.

The Findings

(1) There was a highly significant correlation between a child's drawing development and the ability to 'conserve' on Piagetian tasks.

(2) There was a significant difference between the performance levels of the three cognitive groups. (Conserver, Transitional, Nonconserver)

(3) A partial correlation controlling for age suggests that the performance difference among the groups was more a function of cognitive development than age.

(4) Conservers scored higher than the other two cognitive

groups on all three drawing tests, and the nonconservers scored the lowest.

(5) T tests showed no significant differences in performance among boys and girls.

(6) Children within a cognitive group used similar language strategies to solve drawing problems, and those strategies differed among the three cognitive groups.

Drawing Characteristics for Each Cognitive Group

CONSERVERS showed increased naturalism and detail in their drawings. Objects are drawn smaller and in proportion. Dimensional qualities of objects are represented and use of multiple groundlines to represent perspective show increased spatial awareness. Clarification questioning strategies were used to define the problem and state a plan of action. Very task oriented.

CONSERVER
Age 7.9
Score: 39

TRANSITIONAL CONSERVERS made use of a single groundline with objects arranged juxtaposed. Drawings often contained 'transparencies' or an X-ray effect indicating some egocentric behavior in that the child draws what he *knows*, not what he sees. Spatial arrangements (groundline and sun) show awareness of relationships. Changing the directions was a problem solving strategy.

TRANSITIONAL
Age 6.2
Score: 22

NONCONSERVERS often used idiosyncratic symbols for objects and did not generally anchor them to a groundline. Some children in this group were unable to coordinate parts to form a whole object (failed realism). Least task oriented and showed little concern for understanding directions. This group showed greatest diversity of response.

NONCONSERVER
Age 5.9
Score: 27

4

Readiness for Reading Print

What to Look For

(1) *Failed Realism* — The inability to combine parts to form a whole is a good indication that a child may not be ready to handle a conventional system that requires this cognitive process, i.e., a synthetic phonics program, for example.

(2) *Egocentricity* — Idiosyncratic symbols may be an indication that the child is not ready to accept another point of view and will insist on his own symbols for letters and words, i.e., unaware of dimensional problems.

(3) *Groundline and Juxtapositional Arrangement* — This may be a very good indication that a child is ready to begin a formal reading program. The use of a groundline is an organizational strategy, and lining the objects up may indicate a readiness to work with a left to right progression. Spatial organization (sun, ground, sky) shows awareness of relationships.

(4) *Transparencies* — This may be a sign of a cognitive transitional stage of development. Capabilities will vary depending upon the task. This child recognizes visual discrepancies in his/her drawings but will change the directions to correct or justify the error.

(5) *Scale, Proportion, Perspective* — This level of drawing development is a sign of logical reasoning based on the critical attributes of objects and how they appear in space (visual realism). Confronted with a dimensional problem, the logical thinker will clarify the task and then state a plan to reach a solution. Are these children your best readers?

How to Look

PLAN more open-ended drawing lessons around a single theme for comparative analysis. Group drawings according to the above criteria without looking at names.

OBSERVE children as they are solving drawing problems. Which children find what task most difficult?

SAVE drawing samples and compare them over time to note growth.

TREAT each child's work with dignity, for it represents great effort.

HELP children to be more observant by encouraging them to draw objects they can handle and look at.

ALLOW children to talk while they are drawing. Verbalizing a plan is developmental. The need to talk increases with the difficulty of the task.

Drawing as an Instructional Tool

Capitalizing upon the repetitious use of stereotyped symbols, Penny Platt designed a program to move young children from picture symbols to word symbols (5). When the children were able visually to organize and show relationships in their drawings, Platt began to label the objects in the picture. After labeling the objects themselves, children were asked to read their "word-pictures." Through Platt's *grapho-linguistic* (the meshing of drawing, writing, speaking, reading, and listening) method, the labeling of self-initiated graphic images reinforced by copying the written labels facilitated the child's understanding and transference from the object and its spoken name to its written form. In describing this learning, Platt writes: "The crucial discovery these children made is that not only does everything have a name and a sound image, but also everything has a written name-image as well."

Aside from its usefulness in reading development, drawing provides opportunities for:

observation and selection,
organization and purpose,
problem solving and achievement,
appreciation and discovery, and
self-satisfaction and judgments.

Anyone observing children engrossed in drawing or creative construction projects is aware of the expressive or affective aspect of art-making. Aside from the cognitive functions it serves, art can serve to expand aesthetic awareness and communication of feelings and ideas. As Cohen and Gainer have noted, art is the conscious effort of human beings to arrange colors, shapes, lines, sounds and movements, and other sen-

sory phenomena to express their ideas and feelings about themselves and their world (6). How they do this is governed by what they know.

One final caveat when viewing children's drawings . . . remember that all that is available is not always accessible. As with language, there may be production problems. It is important to ask the child about his drawing before reaching wrong conclusions about his cognitive capabilities.

Age 5.9 — TRANSITIONAL CONSERVER

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